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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,834	08/31/2000	Michael S. Bertone	1662-27800 (P00-3105)	4372

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EXAMINER

LEZAK, ARRIENNE M

ART UNIT	PAPER NUMBER
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2143

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/652,834

Applicant(s)

BERTONE ET AL.

Examiner

Arrienne M. Lezak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to Claims 1-10 have been considered but are moot in view of the new ground(s) of rejection. Further, Applicant has added new Claims 11-16, which are rejected as enumerated herein below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent US 6,496,917 B1 to Cherabuddi in view of US Patent 5,895,484 to Arimilli.

4. Regarding Claims 1, 5 and 10, Cherabuddi discloses a distributed multiprocessing computer system, comprising: a plurality of processor nodes each coupled to an associated memory module, wherein each memory module may store data that is shared between said processor nodes; a Home processor node that includes a data block and a coherence directory for said data block in an associated memory module; on Owner processor node that includes a copy of said data block in a memory module associated with the Owner processor node, said copy of said data block residing exclusively in said memory module; a Requestor processor node that encounters a read or write miss of said data block and requests said data block from the

Home processor node; and wherein said Home processor node receives the request for the data block from the Requestor processor node, forwards the request to the Owner processor node for the data block and performs a speculative write of the next directory state to the coherence directory for the data block without waiting for the Owner processor node to respond to the request (Abstract; Col. 2, lines 66-67; and Col. 3, lines 1-10).

5. Though Cherabuddi discloses a system capable of speculative cache consistency through a snoop information means, Cherabuddi does not specifically teach Applicant's alternative method of a cache directory.

6. Arimilli specifically teaches a method and system for speculatively sourcing cache memory data, (Abstract), that includes a cache directory lookup functionality, (Fig. 2; Col. 4, lines 6-23), and the speculative sourcing of data among cache memories, (Fig. 3; Col. 4, lines 60-67 and Col. 5, lines 1-9). It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to incorporate a speculatively updateable cache directory into the Cherabuddi system as noted within Arimilli.

7. The motivation to combine lies in the desirability to provide an improved sourcing scheme (method and system) for sharing data among cache memories, (Aramilli – Col. 1, lines 58-67). Moreover, as noted herein, Cherabuddi does teach one of many means by which to maintain speculative cache consistency, therefore the basic functionality is already incorporated by implication. Thus, Examiner rejects Claims 1, 5 and 10 as

unpatentable, finding them to be an obvious variation in light of the combined teachings of Cherabuddi in view of Aramilli.

8. Regarding Claims 2 & 6, Cherabuddi and Aramilli are relied upon for those teachings disclosed herein. Cherabuddi discloses a distributed computer system wherein the speculative write of the next directory state occurs only if the next directory state cannot be determined and the Home processor node and Owner processor node are two different processor chips in the computer system, (Col. 3, lines 1-34). Arimilli specifically teaches a method and system for speculatively sourcing cache memory data, (Abstract), that includes a cache directory lookup functionality, (Fig. 2; Col. 4, lines 6-23), and the speculative sourcing of data among cache memories, (Fig. 3; Col. 4, lines 60-67 and Col. 5, lines 1-9). It would have been obvious to combine Cherabuddi and Aramilli, the motivation for which is disclosed herein above. Thus, Examiner rejects Claims 2 & 6 as unpatentable, finding them to be an obvious variation in light of the combined teachings of Cherabuddi in view of Aramilli.

9. Regarding Claims 3 & 7, Cherabuddi and Aramilli are relied upon for those teachings disclosed herein. Cherabuddi discloses a distributed multiprocessing computer system wherein the memory module containing the coherence directory for the data block is in a low latency state that reduces memory read and write access times while the Home processor node is performing the speculative write of the next directory state to the coherence directory for the data block, (Col. 3, lines 29-35 and Col. 4, lines 25-61). Arimilli specifically teaches a method and system for speculatively sourcing cache memory data, (Abstract), that includes a cache directory lookup

functionality, (Fig. 2; Col. 4, lines 6-23), and the speculative sourcing of data among cache memories, (Fig. 3; Col. 4, lines 60-67 and Col. 5, lines 1-9). It would have been obvious to combine Cherabuddi and Aramilli, the motivation for which is disclosed herein above. Thus, Examiner rejects Claims 3 & 7 as unpatentable, finding them to be an obvious variation in light of the combined teachings of Cherabuddi in view of Aramilli.

10. Regarding Claims 4 & 8, Cherabuddi and Aramilli are relied upon for those teachings disclosed herein. Cherabuddi discloses a distributed multiprocessing computer system wherein the next directory state for the data block is corrected if the response by the Owner processor node to the Home processor node request for the data block indicates a different next directory state from the next directory state speculatively written by the Home processor node to the coherence directory for the data block, (Col. 3, lines 1-35 and Col. 4, lines 25-61). Arimilli specifically teaches a method and system for speculatively sourcing cache memory data, (Abstract), that includes a cache directory lookup functionality, (Fig. 2; Col. 4, lines 6-23), and the speculative sourcing of data among cache memories, (Fig. 3; Col. 4, lines 60-67 and Col. 5, lines 1-9). It would have been obvious to combine Cherabuddi and Aramilli, the motivation for which is disclosed herein above. Thus, Examiner rejects Claims 4 & 8 as unpatentable, finding them to be an obvious variation in light of the combined teachings of Cherabuddi in view of Aramilli.

11. Regarding Claim 9, Cherabuddi and Aramilli are relied upon for those teachings disclosed herein. Cherabuddi discloses a distributed multiprocessing computer system wherein the speculative write of the next directory state releases hardware contained in

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the first processor node, allowing said first processor node to accept requests for data blocks and coherency directories for said data blocks stored in the memory module for the first processor node, (Col. 4, lines 62-67 and Col. 5, lines 1-6). Arimilli specifically teaches a method and system for speculatively sourcing cache memory data, (Abstract), that includes a cache directory lookup functionality, (Fig. 2; Col. 4, lines 6-23), and the speculative sourcing of data among cache memories, (Fig. 3; Col. 4, lines 60-67 and Col. 5, lines 1-9). It would have been obvious to combine Cherabuddi and Aramilli, the motivation for which is disclosed herein above. Thus, Examiner rejects Claim 9 as unpatentable, finding them to be an obvious variation in light of the combined teachings of Cherabuddi in view of Aramilli.

12. New Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent US 6,496,917 B1 to Cherabuddi in view of US Patent 5,895,484 to Arimilli.

13. Regarding new Claims 11 & 14, all limitations are addressed relative to Claims 1, 5 and 10 above. Thus, Claims 11 & 14 are also rejected under the combined teachings of Cherabuddi in view of Aramilli.

14. Regarding new Claims 12, 13, 15 and 16, all limitations are addressed relative to Claims 4 & 8 above. Thus, Claims 12, 13, 15 and 16 are also rejected under the combined teachings of Cherabuddi in view of Aramilli.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arrienne M. Lezak whose telephone number is (703)-305-0717. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Wiley can be reached on (703)-308-5221. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-305-6121.

Arrienne M. Lezak
Examiner
Art Unit 2143

AML


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